

REMARKS

1. The Examiner rejected original filed Claims under 35 U.S.C. 103(a) as being allegedly obvious over U. S. Patent 5,540,999, hereinafter called "Yamamoto" in view of U. S. Patent 4,780, 536, hereinafter "Czarnik".

The Examiner asserts in the first Office Action, issued on March 14, 2002 and final Office Action, issued on November 18, 2002 in regard to Original Claim 1 the following:

Regarding claims 1, Yamamoto discloses on figure 1 an organic light-emitting device interposed at least one or more layer comprising an organic compound between anode and cathode. Yamamoto et al does not disclose an organic compound represented by the chemical formula 1. However, Czarnik discloses an organic compound represented by the chemical formula 1 set forth in claim 1. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yamamoto et al by having an organic compound represented by the chemical formula 1 for the purpose of obtaining high temperature resistant polymers for layers of an organic light emitting device.

Applicants respectfully traversed the Examiner's assertion and filed arguments in the responses of September 13, 2002 and May 2, 2003.

2. Amended claim 1 has the following claim limitations:

An organic light-emitting device comprising at least one or more layers interposed between an anode and a cathode, wherein the one or

more layers comprise an organic compound represented by Chemical

Formula 1:

wherein, each R is independently or simultaneously selected from the group consisting of hydrogen atom, C₁-C₁₂ hydrocarbon, halogen, alkoxy, arylamine, ester, amide, aromatic hydrocarbon, heterocyclic compound, nitro, and nitrile (-CN) group.

3. Applicants submit that to establish a *prima facie* case of obviousness, three criteria must be met.

- First, there must be some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings.
- Second, there must be a reasonable expectation of success.
- Third, finally prior art references must teach or suggest all the claim limitations (MPEP 2142).

The Applicant submits that the Examiner has failed to satisfy these criteria regarding original claim 1.

A. Re: Yamamoto

Yamamoto teaches an electroluminescent element which includes an organic compound layer formed of a thiophene polymer as a light emitting layer or a hole injection transport layer.

Yamamoto teaches that all the thiophene polymers include a five-membered ring with excessive π -electrons and hence, have a low ionization potential and a very high hole injecting ability so that when used as a hole material, they are effective for lowering a drive voltage. Due to relatively linear molecules themselves, the thiophene polymers have a short intermolecular distance in film form so that they have high hole mobility and great hole transport ability. See column 5, lines 34-47.

Yamamoto does not teach or suggest using any compound as a hole injection transport layer without a thiophene polymer. A person skilled in the art would have no reason and no motivation to search for a different material and replace the thiophene polymer as thought by Yamamoto.

B. Re: Czarnick

Czarnik teaches that the compounds are used for metal cation binding and metal value removal for various liquid media for metal recovery purposes and/or cleaning-up of the media purposes, and also other applications such as cross-linking agents in thermooxidatively stable polymer syntheses. See Column 1, lines 21-25.

Czarnik teaches that these compounds can be used to conserve valuable chemicals, including metals, by their isolation and recovery. The hexaacid, characterized by a structure nucleus of a hexaazatriphenylene moiety, provides an

unusual affinity for many cations and especially metal cations.

See Column 2, lines 22-33.

Czarnik teaches applications of a hexaazatriphenylene compound for a cation, especially metals, for recovery purposes. See Column 9, lines 20-22.

Czarnik does not teach or suggest that the compound of Chemical Formula 1 can be used as is a hole-injection layer, hole-transporting layer, or hole-injecting-and transporting layer, as recited by claim 2.

4. Applicants submit that Yamamoto does not teach or suggest replacing the thiophene polymer with another compound and Czarnik does not teach or suggest that the compound of Chemical Formula 1 can be used as is a hole-injection layer, hole-transporting layer, or hole-injecting-and transporting layer.

There is no suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine the reference teachings to arrive at the claimed invention.

A combination of the teachings of Yamamoto and Czarnik is based on a hindsight reconstruction of the Applicants' claims. Therefore, the only motivation or suggestion to combine the references is based upon the Applicants' own disclosure.

Furthermore, Yamamoto tries to solve the problem of extending the life of organic electroluminescent elements. See column 1 lines 22-24. Czarnik, however tries to solve the

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problem of conserving valuable chemicals, including metals, by their isolation and recovery. See column 2 lines 22-25.

Applicants finally submit that in making the assessment of differences, section 103 specifically requires consideration of the claimed invention "as a whole." The "as a whole" instruction in title 35 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might break an invention into its component parts (I + II), then find a prior art reference containing I, another containing II, and on that basis alone declare the invention obvious. This form of hindsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result - often the very definition of invention.

Section 103 precludes this hindsight discounting of the value of new combinations by requiring assessment of the invention as a whole. The assurance of an "as a whole" assessment of the invention under § 103 requires a showing that an artisan of ordinary skill in the art at the time of

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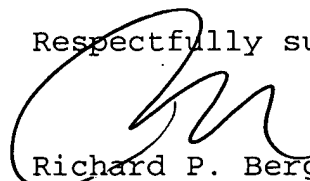
invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would select the various elements from the prior art and combine them in the claimed manner.

The examiner must show some suggestion or motivation, before the invention itself, to make the new combination. The examiner may find a motivation to combine prior art references in the nature of the problem to be solved.

Applicants submit that a motivation to combine the teaching of Yamamoto and Czarnik clearly requires using hindsight in its obviousness analysis because the two references address different problems to be solved.

Applicants therefore submit that currently pending claims 1 and 3-20 are non-obvious in view of Yamamoto and Czarnik.

Respectfully submitted,



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